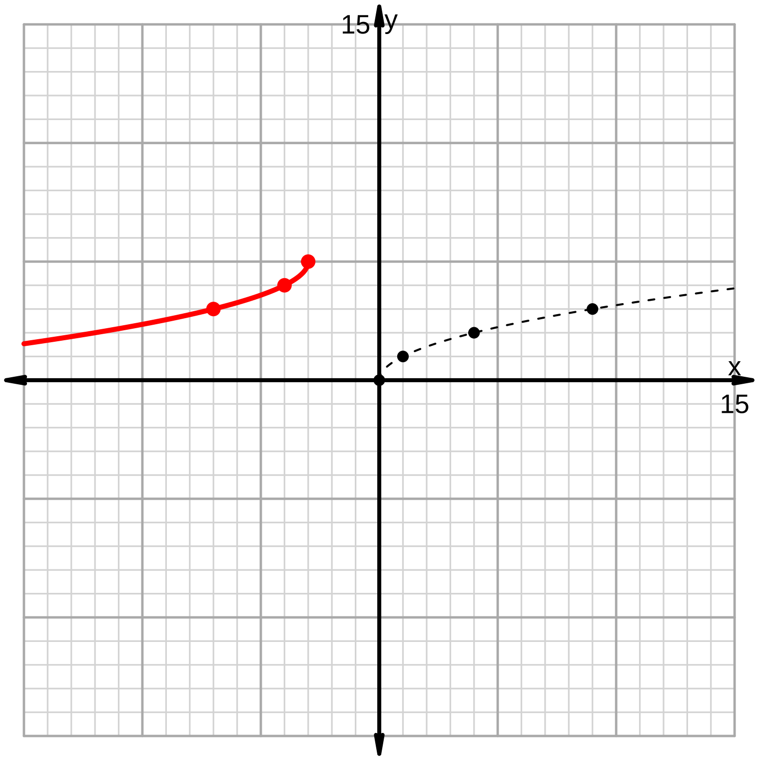
Name: Date:

u10 Radicals, Rationals, and Extraneous Solutions Practice (version 1)

1. Below I've graphed with a dotted curve $y = \sqrt{x}$ with some key points marked with dots. Please draw a graph for $f(x) = -\sqrt{-(x+3)} + 5$, paying close attention to the corresponding key points.



2. State the domain of $y = f(x)$
You can use $x \leq -3$ or $(-\infty, -3]$ to state the domain.

3. State the range of $y = f(x)$
You can use $y \leq 5$ or $(-\infty, 5]$ to state the range.

4. Find all **extraneous** solutions and **actual** solutions to $-\sqrt{-(x+3)} + 5 = x + 10$

$$-\sqrt{-(x+3)} + 5 = x + 10$$

$$-\sqrt{-x-3} = x + 5$$

$$\sqrt{-x-3} = -x - 5$$

$$-x - 3 = x^2 + 10x + 25$$

$$0 = x^2 + 11x + 28$$

$$0 = (x+4)(x+7)$$

So, the possible solutions are $x = -4$ and $x = -7$. Plug each possible solution into the original equation to check.

Check whether $x = -4$ makes equation true.

$$-\sqrt{-((-4)+3)} + 5 \stackrel{?}{=} (-4) + 10$$

$$4 \neq 6$$

Check whether $x = -7$ makes equation true.

$$-\sqrt{-((-7)+3)} + 5 \stackrel{?}{=} (-7) + 10$$

$$3 = 3$$

- Actual solution: $x = -7$
- Extraneous solution: $x = -4$

I should say that there is also a graphical approach possible for this problem. If you use it, please explain.

5.